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AI Assistant Usage in Student Life

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Abstract

AI-powered assistants are becoming embedded in student learning environments, yet their impact on engagement, task performance, and satisfaction remains underexplored. There is limited empirical evidence on how varying levels of AI assistant usage influence student behavior and learning outcomes, particularly in terms of satisfaction and future intention to reuse. This study analyzed a synthetic dataset representing student-AI interaction logs. Classical machine learning models (Linear Regression, Ridge, Random Forest, SVR) and deep learning (TabNet) were trained to predict satisfaction ratings. K-means clustering grouped students based on interaction behaviors. ANOVA tests assessed statistical significance across clusters. Model performance was evaluated using RMSE and R^2 metrics. TabNet achieved the best performance (RMSE: 0.7128, R^2: 0.6106), surpassing all classical models. K-means identified three distinct student profiles differing in AI assistance level and satisfaction. ANOVA results showed significant differences across clusters in task type ($p=0.021$), AI assistance level ($p=0.000$), and satisfaction rating ($p=0.000$). The findings support the use of AI interaction data to profile learners and improve adaptive educational strategies. Institutions can leverage such analytics to personalize support, improve engagement, and optimize AI integration into learning systems.

Keywords: AI Assistant, Student Satisfaction, Tabnet, Clustering, Machine Learning, Adaptive Learning, Deep Learning, Education Analytics